

A study on the response of the Equatorial Ionization Anomaly over the East Africa sector during the geomagnetic storm of November 13, 2012(2015).

Olwendo Ouko Joseph¹; Yosuke Yamazak²; Pierre Cilliers³; **Paul Baki^{4*}**; ⁵Chigomezyo M Ngwira & ⁶Collins Mito

¹University of Lagos, Nigeria ²Lagos State University, Nigeria ³Boston College, Chestnut Hill, MA, USA

^{4*}**Department of Technical & Applied Physics, Technical University of Kenya,** ⁵Makerere University, ⁶Indian Institute of Geomagnetism, Mumbai, India

Abstract

Using a set of up to 12 International GNSS Services (IGS) receivers around the East African region, we present the formation of the peak of ionospheric Equatorial Ionization Anomaly during the geomagnetic storm of 13th November 2012. The diurnal pattern of total electron content (TEC) shows a strong negative storm during the main phase of the storm. Latitudinal variation of TEC shows development of strong Equatorial Ionization Anomaly (EIA) on the recovery phase. Evidence in terms of magnetic variations during the storm period, indicates that the penetration of interplanetary electric fields is the main cause of the negative ionospheric effect during the main phase of the storm. Observation shows the occurrence of very strong westward electric fields arising from the IMF Bz turning southward a few hours after sunset local time. TEC enhancement during the recovery phase on the 16th are attributed to the increased ionospheric disturbance dynamo electric fields. In addition the EIA crest was found to intensify in amplitude as well as expand in latitudinal extent.

Keywords IGS; Ionospheric ionization anomaly; East African region; Geomagnetic storm

Advances in Space Research Vol. 55, pp. 2863–2872(2015).

See more

at: https://www.researchgate.net/profile/Chigomezyo_Ngwira/publication/273705460_A_study_on_the_response_of_the_Equatorial_Ionization_Anomaly_over_the_East_Africa_sector_during_the_geomagnetic_storm_of_November_13_2012/links/55310dc60cf2f2a588abf75c.pdf